

2STR1215

Low voltage fast-switching NPN power transistor

General features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed
- Miniature SOT-23 plastic package for surface mounting circuits
- In compliance with the 2002/93/EC European Directive

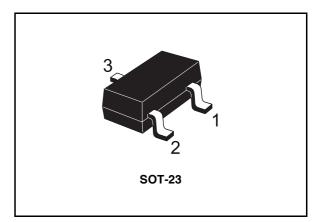
Description

The 2STR1215 is a NPN transistor manufactured using new "PB-HCD" (Power Bipolar High Current Density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

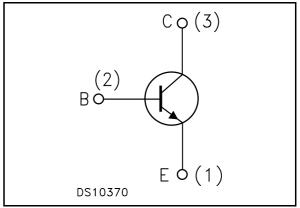
The complementary PNP is the 2STR2215.

Applications

- LED
- Battery charger
- Voltage and relay driver
- Voltage regulation



Internal schematic diagram



Order codes

Part Number	Marking	Package	Packing
2STR1215	115	SOT-23	Tape & reel

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Electrical ratings

	Table 1.	Absolute maximum ratin	q
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Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	15	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	15	V
V _{EBO}	Emitter-base voltage (I _C = 0)	5	V
۱ _C	Collector current	1.5	А
I _{CM}	Collector peak current (t _P < 5ms)	3	А
P _{tot}	Total dissipation at T _{amb} = 25°C	500	mW
T _{stg}	Storage temperature	-65 to 150	°C
Т _Ј	Max. operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R _{thj-amb} ⁽¹⁾	Thermal resistance junction-amb max	250	°C/W

(1) Device mounted on PCB area of 1 cm^2



2 Electrical characteristics

 $(T_{case} = 25^{\circ}C \text{ unless otherwise specified})$

Table 5.	Electrical characterist					
Symbol	Parameter Test Conditions		Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current (I _E =0)	V _{CB} = 15V			0.1	μA
I _{EBO}	Emitter cut-off current (I _C =0)	V _{EB} = 4V			0.1	μA
V _{(BR)CBO}	Collector-emitter breakdown voltage (I _E = 0)	I _C = 100μΑ	15			v
V _{(BR)CEO} ⁽²⁾	Collector-emitter breakdown voltage (I _B = 0)	I _C = 10mA	15			v
V _{(BR)EBO}	Emitter-base breakdown voltage (I _C = 0)	I _E = 100μA	5			v
V _{CE(sat)} ⁽²⁾	Collector-emitter saturation voltage	$I_{C} = 0.1A$ $I_{B} = 1mA$ $I_{C} = 1A$ $I_{B} = 100mA$ $I_{C} = 2A$ $I_{B} = 200mA$		0.25 0.4	0.15 0.5 0.85	V V V
V _{BE(sat)} ⁽²⁾	Base-emitter saturation voltage	I _C = 1A I _B = 100mA		0.9	1.25	v
h _{FE} ⁽²⁾	DC current gain	$ I_{C} = 50 \text{mA} \qquad V_{CE} = 2V \\ I_{C} = 0.5 \text{A} \qquad V_{CE} = 2V \\ I_{C} = 1 \text{A} \qquad V_{CE} = 2V \\ I_{C} = 2 \text{A} \qquad V_{CE} = 2V \\ I_{C} = 2 \text{A} \qquad V_{CE} = 2V $	200 200 130 80	280	560	
C _{CBO}	Collector-base capacitance	$I_E = 0$ $V_{CB} = 10V$ f = 1MHz		16		pF
t _{on} t _{off}	Resistive load Turn-on time Turn-off time	$I_{C} = 1.5A$ $V_{CC} = 10V$ $I_{B1} = -I_{B2} = 150mA$		60 310		ns ns

 Table 3.
 Electrical characteristics

Note (2) Pulsed duration = 300 μ s, duty cycle \leq 1.5%



2.1 Electrical characteristics (curves)

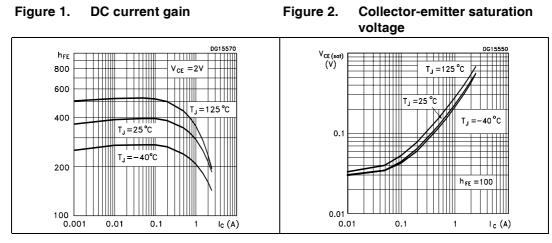


Figure 3. Base-emitter saturation voltage

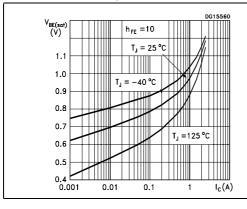
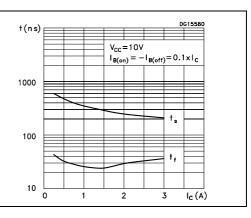
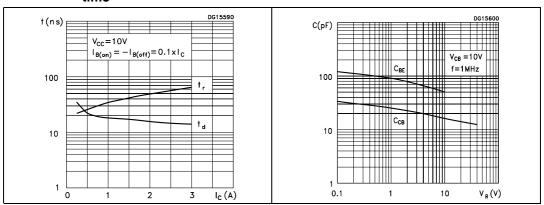


Figure 5. Resistive load switching time









2.2 Test circuits

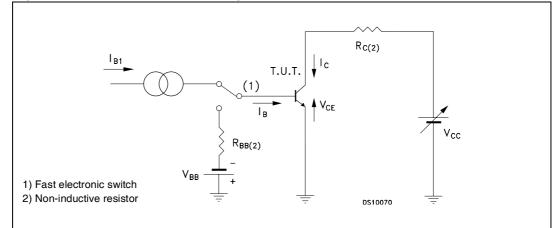


Figure 7. Resistive load switching test circuit

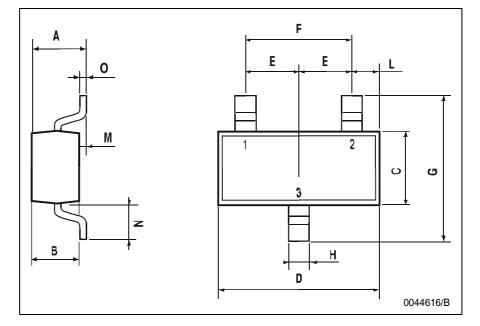


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com



	SOT-23 MECHANICAL DATA					
DIM.	mm		mils			
Diwi.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А	0.85		1.1	33.4		43.3
в	0.65		0.95	25.6		37.4
с	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
Н	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
М	0		0.1	0		3.9
Ν	0.3		0.65	11.8		25.6
0	0.09		0.17	3.5		6.7





4 Revision history

Table 4.	Revision	history
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Date	Revision	Changes
09-Feb-2006	1	Initial release
18-Jul-2006	2	New template



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